

Title	地殻ダイナミクス国際集会
Author(s)	竹下, 徹
Citation	地殻ダイナミクス国際集会報告 (2019)
Issue Date	2019
URL	<a href="http://hdl.handle.net/2433/244077">http://hdl.handle.net/2433/244077</a>
Right	
Type	Research Paper
Textversion	author

## 一般研究集会（課題番号：30K-09）報告書

[申請者（研究代表者）]

氏 名：竹下 徹

職 名：特任教授

所属機関名：北海道大学大学院 理学研究院

下記のとおり、研究集会の実施結果について報告します。

### 記

集会名：地殻ダイナミクス国際集会 "The Second International Symposium on Crustal Dynamics (ISCD-2) -Toward integrated view of island arc seismogenesis-"

主催者名： ※共催の場合

研究代表者：飯尾 能久

所属機関名：京都大学

所内担当者名：飯尾 能久

開催日：平成 31 年 3 月 1 日～平成 31 年 3 月 3 日

開催場所：京都大学 宇治おうばくプラザ きはだホール

参加者数：123 名（所外 100 名、所内 23 名）

- ・大学院生の参加状況：33 名（修士 18 名、博士 15 名）（内数）
- ・大学院生の参加形態 [ ポスター発表、運営補助 ]

### 研究集会報告

#### (1)目的

本国際研究集会の目的は過去 5 年間行われて来た、文部科学省 新学術領域研究（平成 26～30 年度）「地殻ダイナミクスー東北沖地震後の内陸変動の統一的理解ー」(<http://cd.dpri.kyoto-u.ac.jp/>) について、関連する分野の第 1 線の研究者が本テーマについての最先端の研究を共有し、地殻ダイナミクスについて根本的理解を深めることである。また、次世代を担う若手研究者・大学院生に、特に海外からの第 1 線の研究者と議論する場を提供することである。

#### (2)成果のまとめ

本国際集会研究集会では、新学術領域研究「地殻ダイナミクス」の計画研究（本領域の目的と内容については下記を参照）の枠組みに沿って、6 つの計画研究（A01 応力、A02 変形、B01 構造、B02 変形実験、B03 地殻流体、C01 モデル）のグループから 5 年間の研

究で到達された研究成果が発表された（プログラムは別添資料 1 のとおり）。特に新学術領域研究の最大のテーマであった地殻の絶対応力の推定のほか、流体移動と震源移動の関係、鳥取県西部地震の震源域に展開されている「0.1 満点地震観測」の成果、余震域と地質断層の対比、精細 GPS 観測から推定される地殻の変形様式、断層帯の発展、地殻と断層のレオロジー、地殻流体、各種モデリング等についての先端研究の成果を参加者が共有し、今後の新しい研究を模索することが出来た。3 日間の国際研究集会では様々な分野から 14 名の海外からの研究者を含む 120 名を超える研究者・大学院生が参加し、日々活発な研究討議が行われて大変実りの多い国際研究集会となった。

### 【本領域の目的】

東北地方太平洋沖地震（以下、東北沖地震と略記）は世界の科学者の注目を集め、多くの論文が出版されているが、未だ多くの謎に包まれている。その原因は、我々が実は、島弧地殻の基本的な特性や状態を把握していなかったためであると考えられる。まるで、気圧や湿度の値も知らずに天気を予報しようとするようなものであった。本領域では、これまで不明だった応力の絶対値や日本列島の変形場に関する統一的な描像、それらに関連する断層の摩擦係数や地殻・マントルの粘性係数等の島弧内陸の媒質特性を明らかにすることにより、東北沖地震後に生起している諸現象を統一的に理解する。

### 【本領域の内容】

本領域の基本的な研究戦略は、

(A) 応力・歪・歪速度を観測データに基づき推定、(B) 流体を含む媒質特性とその時の空間変化を観察・観測・実験等により推定、(C) これらの知見に基づき数値モデルを構築して観測データを再現し、モデルの検証を行う、というものである。このため総括班の下に 6 つの計画研究班において各項目の研究を進める：

A01 内陸地殻の強度と応力の解明

A02 異なる時空間スケールにおける日本列島の変形場の解明

B01 観察・観測による断層帯の発達過程とマイクロからマクロまでの地殻構造の解明

B02 岩石変形実験による地殻の力学物性の解明：流体の影響

B03 地殻流体の実態と島弧ダイナミクスに対する役割の解明

C01 島弧地殻における変形・断層すべり過程のモデル構築

本報告書では「地殻ダイナミクス」国際集会で発表された講演内容と深く関わる、最近の印刷済の論文を 6 つの計画研究および公募研究ごとに取りまとめた（資料 2）。

### 資料

資料 1 : 「地殻ダイナミクス」国際集会プログラム

**International Symposium**

**Crustal Dynamics (ISCD-2):**

**Toward Integrated View of Island Arc Seismogenesis**

**1-3 March, 2019, Uji, Japan**

Program

Oral Session

**March 1st (Fri.)**

9:30 Opening

9:45 A01 Stress and Strength in the Seismogenic Zones in the Japanese Islands

Toru MATSUZAWA\*

10:00 A02 Earthquake Activities Induced by the 2011 Tohoku-Oki Earthquake Related to the Heterogeneities in Stress and Strength in the Tohoku District

Keisuke YOSHIDA\*, Akira HASEGAWA, Takeyoshi YOSHIDA, Toru MATSUZAWA

10:15 A03 Stress Field in the Aftershock Area of the 2016 Central Tottori Prefecture Earthquake

Yoshihisa IIO\*, Satoshi MATSUMOTO, Shinichi SAKAI, Aitaro KATO

10:30 A04 Estimation of Heterogeneity of Stress Field by Using Misfit Angles in Focal Mechanisms

Yohei YUKUTAKE\*, Yoshihisa IIO

10:45 A05 A Bayesian Estimation of a Focal Mechanisms Based on the Spatial Stress Pattern Inferred From a P wave first-motion dataset

Takaki IWATA\*

11:00 A06 (INVITED) Seismic Anisotropy and its Relation to Stress and Strain in the Crust

Martha SAVAGE\*, Hubert ZAL, Kenny GRAHAM, Yosuke AOKI

11:30 A07 Stress and Strength Control on Complex Rupture of the 2016 Kaikoura, New Zealand Earthquake from Seismic Observation

T. OKADA\*, T. SATO, Y. IIO, S. MATSUMOTO, S. BANNISTER, J. RISTAU, S. OHMI, M. MATSUNO, T. MIURA, M. SAVAGE, J. PETTINGA, F. GHISSETTI, R. H. SIBSON

11:45 A08 (INVITED) Thermo-mechanical Properties of the Seismogenic Crust in Southern California

Egill HAUKSSON\*

12:15 A09 Modeling and Estimating the 3D Absolute Stress Field Using Earthquake Focal

Mechanism Solutions

Toshiko TERAKAWA\*, Egill HAUSSON

12:30 Discussion

12:45 ~ 13:45 Lunch

13:45 Introduction of the session

Takeshi SAGIYA

13:55 A10 (INVITED) Lessons for Subduction Zone Earthquakes from GPS, Repeating Earthquakes, and Physics-based Models

Paul SEGALL\*, Kaj JOHNSON, Camilla CATTANIA

14:25 A11 Formation of Island Arc-Trench System due to Plate Subduction on the Basis of Elastic Dislocation Theory

Yukitoshi FUKAHATA\*, Mitsuhiro MATSU'URA

14:45 A12 Resolution of Inelastic Crustal Deformation in the Japanese Inland and its Tectonic Implications

Takeshi SAGIYA, Angela MENESES-GUTIERREZ, Xuelei ZHANG,  
Koki KUMAGAI

15:05 A13 Lessons from Crustal Responses to Co- and Inter-seismic Stress Disturbances: Japan and SW Taiwan

Youichiro TAKADA, Tomomi INAMATSU, Kotaro TSUKAHARA,  
Takeshi SAGIYA, Takuya NISHIMURA, Kuo-En CHING

15:25 Coffee break

15:40 A14 (INVITED) Luminescence Thermochronometry and the Evolution of Mountains, Climate and Tectonics

Frédéric HERMAN, Georgina E. KING

16:10 A15 Long-term Uplift-denudation of the Japan Arc Revealed by Low-temperature Thermochronology

Takahiro TAGAMI, Shigeru SUEOKA

16:30 Discussion

16:45 ~ 18:15 Poster Session

18:30 ~ Reception

**March 2<sup>nd</sup> (Sat.)**

9:10 B16 (INVITED) Fluid-triggered High-speed Deformation at Different Levels of the Continental Crust: Evidences

from Paleo-earthquake Proxies

Marco HERWEGH\*, Alfons BERGER

- 9:40 B17 Development of the Median Tectonic Line, Mie Prefecture, South-West Japan: A Possible Interpretation for Strain Localization and Softening  
Toru TAKESHITA, Dong Van BUI, Thomas CZERTOWICZ, Shun ARAI,  
Takafumi YAMAMOTO\*, Jun-Ichi ANDO, Norio SHIGEMATSU,  
Koichiro FUJIMOTO
- 10:00 Introduction to two poster presentations (P19 and P20) on the studies of the Median Tectonic Line in the eastern Kii Peninsula, SW Japan  
Norio SHIGEMATSU\*
- 10:10 B18 Fracturing of Plagioclase Grains: Roles for Deformation Mechanism and Fluid Pathway at Lower Crust  
Yusuke SODA\*, Takamoto OKUDAIRA
- 10:25 B19 Distribution and Development Process of Faults Retrieved from Aftershock Areas of the 2000 Western Tottori Earthquake  
Hideki MUKOYOSHI\*, Hideto UCHIDA, Kenta KOBAYASHI, Satoshi TONAI,  
Shunya KANEKI, Tetsuro HIRONO
- 10:40 Coffee break
- 10:55 B20 Heterogeneous Seismic Activity in Focal Area of the 2000 Western Tottori EQ (M7.3) Detected by “0.1 manten” Hyper Dense Seismic Observation  
Satoshi MATSUMOTO\*, Shinichi SAKAI, Aitaro KATO, Yoshihisa IIO
- 11:15 B21 Spatio-temporal Evolution of Micro-Earthquakes Illuminated by “0.1 manten” Hyper Dense Seismic Observation: Implication of Fault Growth  
Aitaro KATO\*, Shinichi SAKAI, Satoshi MATSUMOTO, Yoshihisa IIO
- 11:35 B22 (INVITED) Enhancing Slip Inversions via Joint Seismo-Geodetic Approaches: Examples from Anza and Parkfield, California  
Asaf INBAL\*
- 12:05 Discussion
- 12:10 ~ 13:10 Lunch
- 13:10 B23 Crustal Strength across the Frictional to Plastic Zones: Laboratory Data, Theories, and Extrapolation to Nature  
Ichiko SHIMIZU\*, B02 and Utrecht Groups, B01 MTL Research Group
- 13:30 B24 (INVITED) Physics of Fault Friction at low Shearing Velocities: From the Micro- to Meter Scale  
Christopher J. SPIERS\*
- 14:00 B25 The Evolution of Fault-zone Rheology  
Kiyokazu OOHASHI\*, Toru TAKESHITA, Ken-ichi HIRAUCHI
- 14:20 B26 The Origin of Macroscopic Friction between Single Crystal Mica Surfaces

Hiroshi SAKUMA\*, Kenji KAWAI, Ikuo KATAYAMA, Shigeru SUEHARA

14:40 ~ 14:50 Coffee break

14:50 B27 (INVITED) Diffusion Creep in Eclogites: Relationship Between Mineral Reactions and Deformation and Consequences for Crustal Weakening

Holger STÜNITZ\*, Kai NEUFELD, Ane FINSTAD, Jiri KONOPASEK,  
Renee HEILBRONNER, James MCKENZIE

15:20 B28 Rheological Weakening of the Lower Crustal Rocks Promoted by Anomalous Diffusion of Water

Masanori KIDO\*, Jun MUTO, Sanae KOIZUMI, Hiroyuki NAGAHAMA

15:40 B29 Persistent Deep Afterslip Driven by Nonlinear Transient Mantle Flow and Recovery of Coastal Subsidence after the 2011 Tohoku Earthquake

Jun MUTO\*, James D. P. MOORE, Sylvain BARBOT, Takeshi IINUMA,  
Yusaku OHTA, Syunsuke HORIUCHI, Hikaru IWAMORI

16:00 Discussion

16:10 ~ 18:00 Poster session

### **March 3<sup>rd</sup> (Sun.)**

9:10 C30 Electromagnetic Mapping of Geofluids Using Wideband Magnetotellurics: Implications for Seismogenesis

Yasuo OGAWA\*, Masahiro ICHIKI

9:30 C31 High Resolution Shallow Crustal Structure of the Central Japan by Using Surface-wave Tomography

Hiro NIMIYA\*, Tatsunori IKEDA, Takeshi TSUJI

9:50 C32 Fluid Distribution in the Crust – Inference from Seismic Velocity and Electrical Conductivity

Tohru WATANABE\*, Guillaume DESBOIS, Kenta YOSHIDA

10:10 C33 (INVITED) Preparation Zones for Large Crustal Earthquakes as a Consequence of Fault-Valve Activity

Richard H. SIBSON\*

10:40 C34 Researches for Flux Estimation and Continuous Monitoring of Slab-Derived Fluids

Norio Matsumoto\*, Kohei Kazahaya, Fumiaki Tsunomori, Noritoshi Morikawa

11:00 C35 A 3-D Crust and Uppermost Mantle Electrical Conductivity Model of Subduction Zone Beneath NE Japan

Masahiro ICHIKI\*, Toshiki KAIDA, Yasuo OGAWA

11:20 C36 Roles of Water in Subduction Zone Dynamics

Hikaru IWAMORI\*, Hitomi NAKAMURA, Atsushi NAKAO,

Tatsuji, NISHIZAWA

11:40 ~ 12:40 Lunch

12:40 C37 (INVITED) Study of Potential Biases in Seismologically Estimated Stress Drops of  
Microseismicity Using Dynamically Simulated Earthquake Sources  
Nadia LAPUSTA\*

13:10 C38 Energy Budget of Earthquakes: Investigating the Relation Between Actual and  
Seismologically Inferred Quantities using Dynamic Simulations of Earthquake  
Sequences  
Valère LAMBERT\*, Nadia LAPUSTA

13:25 C39 Timing of Earthquakes on Intraplate Active Faults: Earthquake Sequence Simulation  
Accounting for Stress Perturbation by Megathrust Earthquakes  
Hiroyuki NODA\*

13:45 C40 Crustal Stress, Fault Geometry and Dynamic Rupture: Lessons Learned from Recent  
Earthquake Events  
Ryosuke ANDO\*

14:05 C41 Rapid Mantle Flow with Power-law Creep Explains Transient Deformation Following  
the 2011 Tohoku-Oki Earthquake  
Ryoichiro AGATA\*, Sylvain BARBOT, Kohei FUJITA, Mamoru HYODO,  
Takeshi IINUMA, Ryoko NAKATA, Tsuyoshi ICHIMURA, Takane HORI

14:25 C42 (INVITED) The Anatomy of Subduction Zone: Insight from Geodetic Imaging and  
Modeling  
Sylvain BARBOT\*

14:55 C43 Viscoelastic Corrections of the Earthquake Cycle for Estimating Interplate Coupling  
along the Nankai Trough  
Takuya NISHIMURA\*, Fred F. POLLITZ

15:15 C44 Modeling Deformation and Stress State of the Japanese Island Arc Crust Considering  
Heterogeneous Rheological Structure  
Bunichiro SHIBAZAKI\*

15:35 Discussion

15:40 Coffee break

15:55 Discussion

17:45 Closing

## **Poster Session**

P01 The Subduction of the Philippine Sea Plate and the Origin of the Kanto Plain, Japan  
Naoki UCHIDA\*, Aki ITO



- P02 Cause of the Spatiotemporal Variation of the Earthquake Swarms in Wakayama Region,  
NW Kii Peninsula, Japan  
Sumire MAEDA\*, Makoto OTSUBO, Toru MATSUZAWA
- P03 P-wave Polarity Determination of Waveform Data Observed in Western Japan, Using Deep  
Learning  
Shota HARA\*, Yukitoshi FUKAHATA, Yoshihisa IIO
- P04 Spatio-temporal Analysis of Seismic Anisotropy Associated with the Cook Strait and  
Kaikoura Earthquake Sequence in New Zealand  
Kenny GRAHAM\*, Martha SAVAGE, Richard ARNOLD
- P05 Geological Background of Inland Earthquakes in the Northeast Japan Arc  
Takeyoshi YOSHIDA\*
- P06 Thermal Structure from Supporting Data for Regional Heat Flow Studies in and Around  
Japan  
Akiko TANAKA\*
- P07 Crustal Movement Acceleration Prior to the 2011 Tohoku-Oki Earthquake  
Yo KAWASHIMA\*, Takeshi SAGIYA
- P08 Three Dimensional GPS Velocities and Crustal Deformation in Colombia  
Sindy Carolina LIZARAZO\*, Takeshi SAGIYA, H. MORA-PAEZ
- P09 Intraplate Faulting, Stress Accumulation, and Shear Localization of a Crust-Upper Mantle  
System with Nonlinear Viscoelastic Rheologies  
Xuelei ZHANG\*, Takeshi SAGIYA
- P10 Non-linear Effects on Stress and Brittleness of Viscoelastic Fluids under Transient  
Deformation at Large Strain Rate  
Mie ICHIHARA\*, Masaharu KAMEDA
- P11 Localized Strain Rate in Central and Northeast Japan Before and After the Tohoku-oki  
Earthquake  
Tomomi INAMATSU\*, Youichiro TAKADA, Takeshi SAGIYA, Takuya NISHIMURA
- P12 Elastic/inelastic Behavior of the Upper Crust by Geologic and Geodetic Explorations: Niigata  
High Strain Region (Central Japan)  
Makoto OTSUBO\*, Takeshi SAGIYA
- P13 Quantification of Strain Rate of Brittle Shear Zone in the High Strain-rate Zone, Central  
Japan  
Tomonori TAMURA\*, Kiyokazu OOHASHI, Makoto OTSUBO, Ayumu MIYAKAWA,  
Masakazu NIWA
- P14 Implication of Persistent Ductile Deformation in the Crust from Temporal Variation in coda Q  
in the Northeastern Part of the Niigata-Kobe Tectonic Zone, Central Japan

Masanobu DOJO, Yoshihiro HIRAMATSU\*

P15 Evaluation of Effects Related to Seamount Subduction on a Shallow Accretionary Prism off Muroto Using Ocean Drilling Cores and High Resolution Subbottom Profile Images

Yuichi OKUMA\*, Asuka YAMAGUCHI, Rina FUKUCHI, Hiroaki KOGE, Juichiro ASHI

P16 Revealing the Mountain Building Process of the NE Japan Arc Using Low-temperature Thermochronology: Preliminary Data of the North Area

Shoma FUKUDA\*, Shigeru SUEOKA, Noriko HASEBE, Akihiro TAMURA,  
Tomoaki MORISHITA, Takahiro TAGAMI

P17 Uplift and Denudation History of the South Fossa Magna Region Using Low-temperature Thermochronometric Methods

Yumi KOBAYASHI\*, Shigeru SUEOKA, Shoma FUKUDA, Noriko HASEBE,  
Akihiro TAMURA, Tomoaki MORISHITA, Tagami TAGAMI

P18 Monazite Fission-track Dating Method: Development of Lower-temperature Thermochronometer

Ai SHISHIKURA\*, Etienne SKRZYPEK, Sean JONES, Ling CHUNG, Andy  
GLEADOW, Shigeru SUEOKA, Takahiro TAGAMI

P19 3D Fault Architecture Model along the Median Tectonic Line, Eastern Kii Peninsula, SW Japan

Norio SHIGEMATSU\*, Takuma KATORI, Jun KAMEDA, Ayumu MIYAKAWA

P20 Recent Studies along the Median Tectonic Line (MTL) in the Eastern Kii Peninsula, SW Japan

Norio SHIGEMATSU\*, Koichiro FUJIMOTO, Masao. KAMETAKA, Takamoto  
OKUDAIRA, Hiroshi MORI, Simon WALLIS

P21 Median Tectonic Line Outcrop at Takamiyama in the Central Kii Peninsula, Japan

Tomohiro IMORI, Koichiro FUJIMOTO\*, Norio SHIGEMATSU

P22 Mineralogical and Geochemical Features of Cataclasites and Planar Fault Fougues along the Median Tectonic Line, in the Eastern Kii, SW Japan

Chisaki INAOI, Jun KAMEDA\*, Norio SHIGEMATSU, Tomoyuki OHTANI

P23 Deformation Overprint During the Development of the Median Tectonic Line Fault Zone in Mie Prefecture, Southwest Japan: Evidences for Strain Localization

Dong Van BUI\*, Toru TAKESHITA, Shun ARAI, Takafumi YAMAMOTO, Jun-Ichi  
ANDO

P24 An Introduction to Ryoke Cataclasite Rocks in Tsukide, Mie Prefecture, Japan: An Approach Using 3D Reconstructions from Thin Sections

Thomas Jing-Yi YEO\*, Toru TAKESHITA

P25 The Role of Pressure Solution Creep on Frictional Healing of Quartz Gouge

Naoki NISHIYAMA\*

P26 Formation and Development of Lower Crustal Shear Zones: A Petrological Perspective

Takamoto OKUDAIRA\*, Yusuke SODA

P27 Regional Variations in Mineralogical Characteristics of Fault Rocks Retrieved from  
Aftershock Areas of the 2000 Western Tottori Earthquake

Shunya KANEKI\*, Tetsuro HIRONO, Hideki MUKOYOSHI, Kenta KOBAYASHI,  
Toru TAKESHITA

P28 Microstructure of Fault Zone That Slipped at the Aftershock of M5.5 Orkney Earthquake

Yuki YOKOYAMA\*, Shunya KANEKI, Yasuo YABE, Hiroshi OGASAWARA

P29 Low- to High-velocity Frictional Properties and Microstructure Evolution of Volcaniclastic  
Sediments

Akari FUKU\*, Tetsuro HIRONO, Shunya KANEKI

P30 Estimation of Difference Stress Value Using Residual Strain of Quartz in Deformed  
Conglomerate and Inhomogeneous Strain of Conglomerate Layer -An Example of Multiple  
Collision Zone of Izu-Bonin arc, Hamaishidake Formation, Central Japan-

Shun SUZUKI\*, Kenta KOBAYASHI

P31 Description of Itoigawa-Shizuoka Tectonic Line Outcrop Exposed during Repair Work of  
Fossa Magna Park, Itoigawa, Niigata Prefecture, Central Japan

Keita TAKAHASHI\*, Shun SUZUKI, Kenta KOBAYASHI, Kou TAKENOUCHI,  
Makoto OHKOUCHI

P32 Kinematic and Chemical Processes in the Aftershock Area and the Neighboring Area of the  
2000 Tottori Seibu Earthquake, Japan

Kenta KOBAYASHI\*, Shun SUZUKI, Hideki MUKOYOSHI, Tetsuro HIRONO

P33 The Spatiotemporally Change of the Stress Condition around Hinagu Fault Zone through  
the 2016 Kumamoto Earthquake Sequence, Central Kyushu, Japan

Ayaho MITSUOKA\*, Satoshi MATSUMOTO, Azusa SHITO, Yusuke YAMASHITA,  
Manami NAKAMOTO, Masahiro MIYAZAKI, Shinichi SAKAI, Yoshihisa IIO,  
Group for urgent joint seismic observation of the 2016 Kumamoto earthquake

P34 Non-double Couple Micro-earthquakes in the Focal Area of the 2000 Western Tottori  
earthquake (M7.3) by "0.1 manten" Hyper Dense Seismic Observation

Yuto HAYASHIDA\*, Satoshi MATSUMOTO, Yoshihisa IIO, Shinichi SAKAI, Aitaro  
KATO, Group of "0.1 manten" hyper dense seismic observation

P35 Seismological Imaging Using S-wave Reflection Analysis and Receiver Function Analysis  
about the Fault Zone Extending to the Lower Crust

Shinya KATOH\*, Yoshihisa IIO, Takuo SHIBUTANI, Hiroshi KATAO, Masayo  
SAWADA, Kazuhide TOMISAKA

P36 Strength Profile of The Median Tectonic Line Fault Zone Determined by High-Pressure and  
–Temperature Experiments

Miki TAKAHSHI\*, Chisaki INAOI, Jun KAMEDA, Hiroshi SAKUMA, Norio Shigematsu

P37 The Role of Metasomatic Alteration on Frictional Behavior of Subduction Thrust Faults at  
Seismogenic Depths

Ken-ichi HIRAUCHI\*, Yuzuru YAMAMOTO, Sabine A. M. DEN HARTOG,  
André R. NIEMEIJER

P38 Effects of Temperature on Frictional Strength of Rocks in an Argon Atmosphere

Yuki YOKOYAMA, Michiyo SAWAI\*, Kyuichi KANAGAWA

P39 Nanocrystalline Principal Slip Zones

Berend Antonie VERBERNE\*, Oliver PLÜMPER

P40 First-Principles Investigation for Frictional Characteristics of Brucite and its Application for  
Macroscopic Frictional Characteristics of Sheet-Structure Minerals

Hanaya OKUDA\*, Kenji KAWAI, Hiroshi SAKUMA, Ikuo KATAYAMA

P41 Microstructural Development and Strain Partitioning in Experimentally-sheared Granitic  
Rocks at Brittle Ductile Transition Zone

Shun ARAI\*, Jun MUTO, Masanori KIDO

P42 Dislocation Creep of Orthoenstatite Aggregates under High Pressure and Temperature  
Conditions

Yumiko TSUBOKAWA\*, Tomohiro OHUCHI, Yuji HIGO, Yoshinori TANGE,  
Tetsuo IRIFUNE

P43 Dynamically Recrystallized Microstructures of Quartz in the Sanbagawa Metamorphic Belt,  
Shikoku, Japan

Tadamasa UEDA\*, Ichiko SHIMIZU

P44 Spatial and Temporal Variation of Seismic Velocity in the Japanese Island

Takeshi TSUJI\*, Tatsunori IKEDA

P45 Sintering of Polycrystalline Clinopyroxene and Ultrasonic Velocity Measurements under  
High P-T Conditions

Yumiko TSUBOKAWA\*, Masahiro ISHIKAWA

P46 Laboratory Measurements of  $V_p$ ,  $V_s$ , and  $V_p/V_s$  for Polycrystalline Labradorite up to 800°C  
and 1GPa

Satoko HONDA\*, Masahiro ISHIKAWA

P47 Magnetotelluric Imaging of Kitakami Mountains, Forearc of NE Japan, in Search for Water  
Wall

Masato FUKAI, Yasuo OGAWA\*, Kuo-Hsuan TSENG, Masahiro ICHIKI,  
Shinichi TAKAKURA

- P48 Comparison of Permeability of Fault Zone Between In-situ Hydraulic Tests and Laboratory-Derived Data at the Median Tectonic Line, Central Japan  
Norio MATSUMOTO\*, Norio SHIGEMATSU
- P49 Estimation of Magmatic Water Content in Saline Groundwater in Tohoku district, Japan  
Yoko S. TOGO\*, Kohei KAZAHAYA, Masaaki TAKAHASHI, Yuki TOSAKI,  
Noritoshi MORIKAWA, Hiroshi A. TAKAHASHI, Tsutomu SATO, Keika HORIGUCHI
- P50 Chlorine Rich Prograde Mineral Assemblage Observed in Diamond-Bearing Garnet Peridotite from the Qianghai Province, NW CHINA  
Kosuke NAEMURA\*
- P51 Saline Fluid Inclusions in Pinatubo Mantle Xenoliths Linking Subducted Seawater to Arc Magmas  
Tatsuhiko KAWAMOTO\*, Jun-Ichi KIMURA, Qing CHANG, Masako YOSHIKAWA,  
Mitsuru OKUNO, Tetsuo KOBAYASHI
- P52 Quantitative Relationship between Aseismic Migration Speed and Frictional Properties  
Keisuke ARIYOSHI\*, Jean-Paul Ampuero, Roland Bürgmann, Toru MATSUZAWA,  
Akira HASEGAWA, Ryota HINO, Takane HORI
- P53 Modulation of Fault Strength during the Seismic Cycle by Grain-size Evolution around Contact Junctions  
Sylvain BARBOT\*
- P54 Quasi-static Simulation of Earthquake Cycles in the Nankai Trough, Southwest Japan, Based on Finite Element Modeling  
Ryoichiro AGATA\*, Takane HORI, Kohei FUJITA, Mamoru HYODO, Tsuyoshi ICHIMURA
- P55 Coulomb Stress Change of Inland Faults during a Megathrust Earthquake Cycle in Southwest Japan  
Tsukasa MITOGAWA\*, Takuya NISHIMURA
- P56 Dense GNSS Observation in the San-in Shear Zone After the 2011 Tohoku-oki Earthquake  
Angela MENESES-GUTIERREZ\*, Takuya NISHIMURA
- P57 Revisiting the Coseismic Slip Distribution of the 2011 Tohoku-oki Earthquake Considering Early Postseismic Deformation and Heterogeneous Structure  
Takeshi IINUMA\*, Ryoichiro AGATA, Yusaku OHTA, Ryota HINO, Takane HORI
- P58 Mechanism of Interseismic Subsidence of the Northeast Japan Forearc During the Late Period of a Gigantic Earthquake Cycle  
Ryohei SASAJIMA\*, Bunichiro SHIBAZAKI, Hikaru IWAMORI, Takuya NISHIMURA
- P59 Modeling Absolute Stress Fields in the Hanging Wall of the Northeast Japan Forearc Before and After the 2011 Tohoku Earthquake

Ryohei SASAJIMA\*, Bunichiro SHIBAZAKI, Hikaru IWAMORI, Keisuke YOSHIDA  
P60 Constructing A New Locking Model for the Southern Kurile Trench Including Viscoelastic  
Relaxation and Upper Plate Deformation

Yuji ITOH\*, Takuya NISHIMURA, Kelin WANG, Jiangheng HE, Tianhaozhe SUN  
P61 Numerical Simulations of Tsunamis at Hypothetical Megathrust Earthquakes

Shion OSADA\*, Tetsuro HIRONO, Shoichi YOSHIOKA, Toshitaka BABA  
P62 History of Crustal Deformation and Estimated Earthquake Recurrence Along the Sagami  
Trough

Junki KOMORI\*, Ryosuke ANDO, Masanobu SHISHIKURA

## 資料2:「地殻ダイナミクス」国際集会で発表された講演内容と深く関わる最近の論文

### 1. 論文リスト

#### A01 (5) :

A01-1: Sendai-Okura earthquake swarm induced by the 2011 Tohoku-Oki earthquake in the stress shadow of NE Japan: Detailed fault structure and hypocenter migration, \*Yoshida, K., and Hasegawa, A., Tectonophysics, 2018.

A01-2: A Bayesian approach to estimating a spatial stress pattern from P-wave first-motions, \*Iwata, T., J. Geophys. Res., 2018.

A01-3: Heterogeneities in stress and strength in Tohoku and its relationship with earthquake sequences triggered by the 2011 M9 Tohoku-Oki earthquake, \*Yoshida, K., Hasegawa, A., Yoshida, T., and Matsuzawa, T., Pure Appl. Geophys., 査読有, 176, 1335-1355, 2018.

A01-4: Complex microseismic activity and depth-dependent stress field changes in Wakayama, southwestern Japan, \*Maeda, S., Matsuzawa, T., Toda, S., Yoshida, K., and Katao, H., Earth, Planets Space, 査読有, 70, 2018.

A01-5: Hypocenter migration and seismicity pattern change in the Yamagata-Fukushima border, NE Japan, caused by fluid movement and pore pressure variation, \*Yoshida, K., and Hasegawa, A., J. Geophys. Res., 査読有, 123, 5000-5017, 2018.

#### A02 (5):

A02-2: Estimate of the contraction rate of central Japan through the deformation of the Philippine Sea slab, \*Fukahata, Y., Progress in Earth and Planetary Science, 査読あり, 6:4, <https://doi.org/10.1186/s40645-018-0251-0>, 2019.

A02-3: Triangulation scale error caused by the 1894 Shonai earthquake: a possible cause of erroneous interpretation of seismic potential along the Japan Trench, \*Sagiya, T., N.

- Matta, Y. Ohta, Earth, Planets and Space, 70:120, doi:10.1186/s40623-018-0890-9, 査読有, 2018.
- A02-4: Crustal deformation process in the Mid-Niigata region of the Niigata-Kobe Tectonic Zone as observed by dense GPS network before, during, and after the Tohoku-oki earthquake, \*Meneses-Gutierrez, A., T. Sagiya, S. Sekine, Journal of Geophysical Research: Solid Earth, 123, doi:10.1029/2018JB015567, 査読有, 2018.
- A02-5: Intraplate strike-slip faulting, stress accumulation and shear localization of a crust-upper mantle system with nonlinear viscoelastic material, \*Zhang, X., T. Sagiya, Journal of Geophysical Research: Solid Earth, 査読有, 123, doi:10.1029/2018JB016421, 2018.
- A02-6: Interseismic crustal deformation in and around the Atotsugawa fault system, central Japan, detected by InSAR and GNSS, \*Takada, Y., T. Sagiya, T. Nishimura, Earth, Planets and Space, 査読有, 70, doi:10.1186/s40623-018-0801-0. 2018.
- B01 (4):
- B01-1: Source fault model of the 2018 Mw 5.6 northern Osaka earthquake, Japan, inferred from the aftershock sequence, \*Kato, A., and Ueda, T., Earth, Planets Space, 査読有, 71, 2019.
- B01-2: The architecture of long-lived fault zones: insights from microstructure and quartz lattice-preferred orientations in mylonites of the Median Tectonic Line, SW Japan, \*Czertowicz, T. A., Takeshita, T., Arai, S., Yamamoto, T., Ando, J.-I., Shigematsu, N., and Fujimoto, K.-I., Progress in Earth and Planetary Science, 査読有, 6, 2019.
- B01-3: Prestate of Stress and Fault Behavior During the 2016 Kumamoto Earthquake (M7.3), \*Matsumoto, S., Yamashita, Y., Nakamoto, M., Miyazaki, M., Sakai, S., Iio, Y., Shimizu, H., Goto, K., Okada, T., Ohzono, M., Terakawa, T., Kosuga, M., Yoshimi, M., and Asano, Y., Geophys. Res. Lett., 査読有, 45, 637-645, 2018.
- B02 (3):
- B02-1: Frictional properties of simulated chlorite gouge at hydrothermal conditions: Implications for subduction megathrusts, Okamoto, A.S., \*Verberne, B.A., Niemeijer, A.R., Takahashi, M., Shimizu, I., Ueda, T., and Spier, C.J., J. Geophys. Res., 124, <https://doi.org/10.1029/2018JB017205>
- B02-2: Strain localization and fabric development in polycrystalline anorthite + melt by water diffusion in an axial deformation experiment, \*Fukuda, J.-i., Muto, J., and Nagahama, H., Earth, Planets Space, 査読有, 70, 2018.
- B02-3: 断層の強度に関する論争と学際的アプローチの必要性, \*高橋美紀, 廣瀬丈洋, 飯尾能

久, 査読有, 地質学雑誌, 124, 725-739, 2018. <https://doi.org/10.5575/geosoc.2018.0015>

B03 (4):

- B03-1: Geochemical mapping of slab-derived fluid and source mantle along Japan arcs, \*Nakamura, H., Iwamori, H., Nakagawa, M., Shibata, T., Kimura, J.-I., Miyazaki, T., Chang, Q., Vaglarov, B. S., Takahashi, T., and Hirahara, Y., Gondwana Res., 査読有, 70, 36-49, 2019.
- B03-2: Roles of Hydrous Lithospheric Mantle in Deep Water Transportation and Subduction Dynamics, \*Nakao, A., Iwamori, H., Nakakuki, T., Suzuki, Y. J., and Nakamura, H., Geophys. Res. Lett., 45, 5336-5343, 2018.
- B03-3: Distribution of slab-derived fluids around the edge of the Philippine Sea Plate from Central to Northeast Japan, \*Nakamura, H., Iwamori, H., Ishizuka, O., and Nishizawa, T., Tectonophysics, 査読有, 723, 297-308, 2018.
- B03-4: In-situ permeability of fault zones estimated by hydraulic tests and continuous groundwater-pressure observations, \*Matsumoto, N., and Shigematsu, N., Earth, Planets Space, 査読有, 70, 2018.

C01 (2):

- C01-1: Dynamic Rupture Simulation Reproduces Spontaneous Multifault Rupture and Arrest During the 2016 Mw7.9 Kaikoura Earthquake, \*Ando, R., and Kaneko, Y., Geophys. Res. Lett., 査読有, 45, 12,875-812,883, 2018.
- C01-2: San-in shear zone in southwest Japan, revealed by GNSS observations, \*Nishimura, T., and Takada, Y., Earth, Planets Space, 査読有, 69, 2017.

公募研究 (6)

- K-1: Evidence for multiple stages of serpentinization from the mantle through the crust in the Redwood City Serpentine mélange along the San Andreas Fault in California, \*Uno, M., and Kirby, S., Lithos, 査読有, 336-337, 276-292, 2019. <https://doi.org/10.1016/j.lithos.2019.02.005>
- K-2: Evolution of hydraulic and elastic properties of reservoir rocks due to mineral precipitation in CO2 geological storage, \*Tsuji, T., Ikeda, T., and Jiang, F., Comput. Geosci., 査読有, 126, 84-95, 2019.
- K-3: Repeated drainage from megathrusts during episodic slow slip, \*Nakajima, J., and Uchida, N., Nature Geoscience, 査読有, 11, 351-356, 2018.
- K-4: What is the origin of macroscopic friction?, \*Sakuma, H., Kawai, K., Katayama, I., and



- Suehara, S., Science Advances, 査読有, 4, eaav2268, 2018.
- K-5: Volcanic activities triggered or inhibited by resonance of volcanic edifices to large earthquakes, \*Namiki, A., Rivalta, E., Woith, H., Willey, T., Parolai, S., and Walter, T. R. Geology, 47, 67-70, 2018.
- K-6: Fluid inclusions in jadeitite and jadeite-rich rock from serpentinite melanges in northern Hispaniola: Trapped ambient fluids in a cold subduction channel, \*Kawamoto, T., Hertwig, A., Schertl, H.-P., and Maresch, W. V., Lithos, 査読有, 308-309, 227-241, 2018.